1a $f(x) = xe^{-2x}$

+1 $f'(x) = e^{-2x} - 2xe^{-2x}$

$e^{-2x}(1-2x)$

$e^{-2x} = 0$, $1-2x = 0$

$e^{-2x} \neq 0$ $x = \frac{1}{2}$ +1

$1-2x=0$ $\frac{2x}{2} = \frac{1}{2}$

+++ | − − −

$\frac{1}{4}$ $\frac{1}{2}$ 1

$[0, \frac{1}{2}]$ = increasing +1

$[\frac{1}{2}, 10]$ = decreasing +1

b

(0) $\frac{1}{2}$ (10)

absolute max = $\frac{10}{e^{20}}$

xe^{-2x}

$10e^{-20} = \frac{10}{e^{20}}$

absolute min = 0

$0e^{0} = 0$

+1 checking end pts and critical #

+1 abs max $(\frac{1}{2}, \frac{1}{2e})$ ~~is an abs~~

+1 justifying

+1 abs min $(0,0)$

+1 justification

$y = xe^{-2x}$

$x=0$

$x=\frac{1}{2}$

$x=10$

$(\frac{1}{2}, \frac{1}{2e})$ is the absolute maximum because absolute extrema occur at relative extrema or endpoints and I've checked all 3.

OR $(\frac{1}{2}, \frac{1}{2e})$ is the absolute maximum because there is only one ~~relative ex~~ critical point for xe^{-2x} and it is a maximum.

Dec 18-8:13 AM

1980 AB4/BC1

9) $s''(t) = a(t) \quad s'(t) = v(t) \quad 10\int e^{2t} = \frac{e^{2t}}{2} + C$

$a(t) = 10e^{2t} \quad \therefore \quad s''(t) = 10e^{2t}$

$v(0) = 5 \quad s'(0) = 5$

$v(t) = \frac{10e^{2t}}{2} + C$

$v(0) = \frac{10e^{2(0)}}{2} + C$

$= \frac{10(1)}{2} + C = 5 + C$

$5 + C = 5$

$C = 0$

$v(t) = \frac{10e^{2t}}{2} + 0$